any burnishing tool alter by use, it is restored by friction upon a skin or leather attached to a wooden block, which is fixed to the bench. The leather is covered with polishing rouge in impalpable powder, or, preferably, with pure alumina, obtained by calcining ammonia alum in a forge fire. Venetian tripoli, rottenstone, tin putty, emery, or many other hard substances finely powdered may be employed. The burnishing tools are of various shapes, such as a lance, a tooth, a knife, a half sphere, or a dog's tongue, and a considerable stock is necessary. The burnishing is divided into two distinct operations. The first consists in roughing, and the second in finishing. The tools for the first have a sharp edge, while for the second operation they have a rounded surface. The tools for the hand or the lathe are fixed by copper ferrules into short round wooden handles, so that the hand is not influenced by their weight. The tools for the arm or vice are fastened to wooden handles, sufficiently long to rest their slender part upon the arm or shoulder. The stouter lower portion is grasped by the hand. The burnishing tools and the objects must be frequently wetted by certain solutions, some of which facilitate the sliding of the instrument, or with others which have a chemical action upon the shade of the burnished articles. Of the first are pure water, solutions of soap, decoctions of linseed and infusions of the roots of marsh mallow or licorice. The second includes wine-lees, cream of tartar, vinegar, alum in water. When burnishing gold applied upon electro-deposits of copper, as is gilding with a dead luster by that method, use pure water, for fear of producing a disagreeable red shade. A solution of green soap is sometimes preferred by operators, although when old, it imparts an unpleasant tinge, owing to the sulphides of the liquor. When the burnishing is completed, the surface is wiped longitudinally with a soft and old calico rag. The polish obtained by burnishing is called black when it reflects the rays like a mirror, and should the presence of mercury or a bad deposit prevent the tool from producing a bright surface, the object is said to be greasy. Articles which have been previously polished, and which generally receive a very trifling deposit, are not burnished, but rubbed with chamois leather and the best polishing rouge. Too thick or too rapid electro deposits cannot be burnished, but must be polished by rubbing with a leather and a mixture of oil and powered pumice stone, tripoli, or tin putty. Coarse powders are used at the begining, and impalpable ones at the end of the operation. Polished silver deposits are more agreeable to the eye than burnished ones, but the hardening of the latter renders them more durable.—*Scientific American.*

REMARKS ON THE WATCH.

Of all the different escapements, a well constructed anchor is undoubtedly the best for all practical purposes. A pocket chronometer is not as reliable, while, if of larger dimensions, and provided with all the possible mechanical appliances, adjuncts, and improvements, a marine chronometer doubtlessly is the best timepiece constructed. When we say "for practical purposes," we do not by any means wish to have it interpreted that the watch may be treated with impunity to any and every indignity, or be used as a toy for children. Let us examine any other piece of machinery; how strong and powerful it is in any and all its parts: still, it is never required to perform one-half the work of the tiny watch, which unremittingly labors day and night, week day and Sunday, month and year, without intermission or stop, and if it has been duly cared for and tenderly treated, it may arrive at the good old age of one hundred years, while the ponderous machinery is cleaned and oiled every day, with hosts of men to attend to its wants, and lasts only for a span of years.

It will be easily seen that any exterior motions exert an important influence upon the vibration, and consequently upon the arbor and pivots of the balance. If this external motion is in the direction of the vibrating plane of the balance, and a vibration occurs simultaneously in the same direction, the vibration arc is increased; if in the opposite direction, such an arc will be decreased, and it is only without damage if it occurs vertical to the balance axis.

The most ordinary external motions, however, occur in another direction than that of the balance, whereby a sensible pressure is exerted upon the axis of the vibrating mass, productive of an increased friction of the pivots upon their bearings, etc., and a retarding, never an acceleration, takes place. For instance, the balance of a watch of a better construction vibrates 18,000 per hour, consequently 432,000 vibrations in twenty-four hours.* Let us suppose such a watch were quietly laid down or hung up for *about ten hours*—*whereby it would go correctly*; but in the next succeding fourteen hours, it would be worn, the general length of time, and if each vibration of the balance were retarded only by 0.0001, it would be equal to fourteen hours to 25.2 vibrations, or 5.04 seconds; by a regular use, therefore, in one week, 35.28 seconds, and in one month, 2.52, or *nearly three minutes.*

By most watches, where the pivot holes are of ruby, the retard of a watch is far larger, and stands pretty well in ratio with the construction and finish of the movement.

A marine chronometer, regulated to an almost imperceptible difference, and having proved excellent upon a long sea voyage, would, when worn as a watch, in consequence of the external motion experienced, go too slow, and far more so than a good anchor watch. Beside all imaginable advantageous improvements, these chronometers are fitted into a separate box, in the so-called compass suspension, and suspended in such a manner that they do or should remain in an equal position in all the different motions of a ship.

From the preceding remarks it is very clear that a careful treatment of any, especially a fine-graded watch, is of great moment, and only with such care it will go apparently correct. The winding should be performed slowly, and strong external motion be prevented, and always be done in the morning; it thus will work well during the day, with the best traction power of its spring, whereby the external motions to which it is exposed *during daytime, are pretty well* counterbalanced, and immensely better than when wound at night, because it has only the weakened spring to offer as resistance next day. The breaking of the spring, also, need not be feared, as it is no longer at full tension during the night,

*Vibrations-18,000 per hour, 432,000 per day 12,960,000 in 30 days (one month), 157,680,000 in 365 days. A seconds pendulum makes 3,600 oscillations in one hour: 86,400 a day: 2,592,000 in 30 days (1 month): 31,536,000 in 365 days—one year: A marine chronometer, which marks ½ seconds, makes 14,400 in an hour, 345,600 per day, 10,368,000 in 30 days. 126,144,000 in 365 days.